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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/720,598	05/07/2001	Gerald Bocquet	022701-915	2355

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EXAMINER

SACKEY, EBENEZER O

ART UNIT PAPER NUMBER

1626

DATE MAILED: 12/31/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.  
09/720,598

Applicant(s)  
BOCQUENET ET AL.

Examiner  
EBENEZER SACKEY

Art Unit  
1626



-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136 (a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on Dec 4, 2002.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11; 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 22-39 is/are pending in the application.
- 4a) Of the above, claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 22-39 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claims \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.  
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

## Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgement is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☒ All b) ☐ Some\* c) ☐ None of:  
1. ☐ Certified copies of the priority documents have been received.  
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).  
\*See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. § 119(e).  
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

## Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_\_
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s). \_\_\_\_\_ 6) ☐ Other:

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## **DETAILED ACTION**

### ***Continued Examination Under 37 CFR 1.114***

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 12/04/02 has been entered.

Claims 1-21 have been canceled. New claims 22-39 have been introduced.

### ***Claim Rejections - 35 U.S.C. § 112***

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

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3. Claims 23-33 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

The claims above depend on canceled claim 1. Correction of claim dependency is required. Additionally, the expressions "preferably and more preferably" (claim 28 line 3) renders the claim indefinite because it is unclear whether the limitation(s) following the expression is part of the claimed invention. See M.E.P.... § 2173.05(d).

### ***Claim Rejections - 35 U.S.C. § 103***

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a

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background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
  2. Ascertaining the differences between the prior art and the claims at issue.
  3. Resolving the level of ordinary skill in the pertinent art.
  4. Considering objective evidence present in the application indicating obviousness or nonobviousness.
6. Claims 22-39 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tanaka et al. (U.S. Patent No. 3,658,810) or WO 98/37063 or WO A-96/22974.

Applicants claim a process for producing a lactam by a reaction between water vapor and an aminonitrile in vapor phase in the presence of a catalyst, comprising providing water in vapor phase, and vaporizing the aminonitrile by feeding the aminonitrile in a liquid phase to be in contact with the water vapor, before contacting the resulting mixture with the catalyst.

Determination of the scope and content of the prior art (M.E.P., §2141.01)

Tanaka et al. disclose the preparation of caprolactam by contacting continuously with steam aminocaproic acid or caproamide or a mixture of the two at a temperature of between 150-400°C in the presence of a

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catalyst. See column 1, lines 14-31, column 2, lines 68-72. WO '082' discloses the preparation of caprolactam by treating 6-aminocaproic acid, 6-aminocaproate ester or 6-aminocaproamide or mixtures thereof in the presence of super heated steam in which a gaseous mixture comprising caprolactam and steam are obtained. See page 1, lines 1-12, page 2, lines 29-35, page 3, lines 25-38 page 5, lines 18-37, page 6, lines 1-4. It would have been obvious to prepare compounds by methods of the references in the absence of any unobvious results especially since only the caprolactam is being produced. It is obvious to prepare compounds by old methods or series of methods using like or analogous starting materials.

Ascertainment of the difference between the prior art and the claims (M.E.P.. §2141.02)

The difference between the instant process and the prior art is that the instant process is directed to "vaporizing a mixture" and the requirement that the aminonitrile in liquid phase to be in contact with the water vapor before contacting the resulting mixture with the catalyst, whereas the prior discloses the simultaneous contact between the mixture of "steam" and

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aminocaproic acid or caproamide (reactants) and the catalyst in the reaction zone.

*Finding of prima facie obviousness---rational and motivation (M.E.P.. §2142-2143)*

It would have been obvious to prepare compounds by methods of the references in the absence of any unobvious results especially since only the caprolactom is being produced. It is obvious to prepare compounds by old methods or series of methods using like or analogous starting materials. The instantly claimed process would therefore have been suggested to one of ordinary skill in the art.

***Response to Remarks***

Applicant's arguments filed 12/04/02 have been fully considered but they are not persuasive. Applicants argue that the applied references do not disclose or suggest each feature of the instant claims. This argument is unpersuasive because the question is whether the claimed features are obvious over the disclosure of the references. The disclosures are obvious. Applicants argue that one aspect of the present invention as defined in claim

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1, is a process for producing a lactam. First, the Examiner would like to point out that claim 1, is canceled and furthermore, canceled claim 1 was directed to vaporizing an aminonitrile and water, not directed to a process for producing lactam. Tanaka et al. '810' relates to a process for producing caprolactam by contacting aminocaproic acid, aminocaproamide or a mixture of the two with steam in the presence of a catalyst. See the entire publication, especially column 1, lines 14-21. Nothing unobvious is seen between the instant process and that of '810'. The only difference is that in '810', the reactants and the catalyst contact each other simultaneously in the reaction zone, whereas the instant process requires the water vapor and aminonitrile to be in contact before contacting the catalyst. No showing of unexpected results or of an improved yield has been forth coming. The advantages between the simultaneous contact of aminocaproic acid, aminocaproamide or a mixture of the two with steam in the presence of a catalyst in the reaction zone and the instant process wherein water vapor and aminonitrile are in contact before contacting the catalyst in the reaction zone must be established by factual evidence. Applicants further argue that



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there is no disclosure or suggestion of feeding the aminonitrile in liquid phase to be in contact with water vapor before contacting the resulting mixture with the catalyst. Even though, this feature is not disclosed, '810' discloses that "the intended ring closure reaction of the starting material progresses." See column 4, lines 42-51.

Applicants next argue that WO 98/37063 herein referred to as '063' fails to disclose or suggest each feature of the instant invention or process. Again, it not the disclosure of the features of the present invention but, rather how obvious are the features of the claimed process compared to that of the reference. Applicants argue that '063' does not disclose or suggest vaporizing an aminonitrile by feeding the aminonitrile in liquid phase to be in contact with water vapor, before contacting the resulting mixture with a catalyst, as recited in instant claim 22. This is unpersuasive because '063' discloses that a vapor phase hydrolysis reaction in which superheated steam is used produces a lactam in the presence or absence of a catalyst. See page 5, lines 7-24. Additionally, '063' discloses that the hydrolysis can be performed in the liquid phase in the presence of a homogeneous

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catalyst. See page 5, lines 31-33. Applicants next argue that '063' discloses "disadvantages" of employing a catalyst in the process thereof and, therefore, "teaches away" from the claimed process. This argument is unpersuasive because no comparative showing has been forth coming to distinguish between the instant process and that of '063', and additionally, '063' teaches that the process can be practiced with or without a catalyst.

Applicants next argue that WO 96/22974, herein referred to as '974' relates to preparing lactam by means of a vapor phase reaction between an aliphatic aminonitrile and water in the presence of a solid catalyst fail to disclose or suggest vaporizing an aminonitrile by feeding the aminonitrile in liquid phase to be in contact with water vapor, before contacting the resulting mixture with a catalyst, as recited in instant claim 22. Again, no showing of an unexpected result or improved yield has been forth coming to distinguish between the instant process and '974'.

Claims 23, 24, 28, 31, 34-37 relates to temperature and pressure range of the instant process. These ranges are well within the purview of the skilled artisan and also disclosed by the references. See for example

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'063', page 2, lines 5-8. Claims 25 and 26 relate to the aminonitrile being fed as a film or in atomized form. The references are silent on this limitation. Claims 33 and 39 relate to dwell time of aminonitrile in the vaporizing stage. This limitation is also not disclosed. However, these limitations are a manipulation of process parameters to improve product and/or yield. The instantly claimed process would therefore have been suggested to one of ordinary skill.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to E. Sackey whose telephone number is (703) 305-6889. The examiner can normally be reached on Monday-Friday from 7:30 am to 4:30 pm.

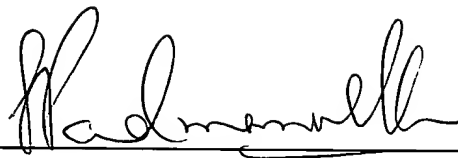
If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Joseph K. McKane, can be reached on (703) 308-4537. The fax phone number for this Group is (703) 308-4556.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Group receptionist whose telephone number is (703) 308-1235.

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EOS

December 26, 2002



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(f.w)

Joseph K. McKane

12/27/02

Supervisory Patent Examiner

Art Unit 1626, Group 1600

Technology Center 1